Safely collecting gas, vapor and water samples…

Glovebag Sampling System

The INEEL-designed and deployed Glovebag Sampling System allows subsurface water and vapor samples to be safely retrieved in the field with appropriate levels of quality control. This system supports retrieval of samples directly from Vapor Port and the Suction Lysimeter Probes. These are two subsurface instruments, along with a suite of other probes, used at the INEEL to facilitate on-site analysis of environmental conditions in and around waste disposal areas.

The INEEL's portable glovebag accommodates collection of field samples in a timely, efficient and cost-effective manner.

Why the glovebag is needed

The INEEL Environmental Restoration Program needed to retrieve soil gas and water samples from numerous probes inserted into transuranic waste disposal areas. The Program also needed to control the integrity of the samples and to protect workers and the environment from exposure to potential and unknown contaminants.

What the system does

In response to the Program's need, the Glovebag Sampling System was designed to collect soil gas and water samples from numerous subsurface probe sites within the Subsurface Disposal Area at the INEEL's Radioactive Waste Management Complex. The system accesses samples using quick-couple connections between the protective weather boxes atop probe casings and the glovebag. Once connected, samples are transferred into the glovebag where water samples are transferred to a fume hood for required separation, packaging and transfer. Vapor samples are analyzed using a photoacustic portable gas analyzer.

System description

The sampling system is lightweight and can be easily set up and quickly connected to probe sample box connections. The glovebag is 48 inches long, 36 inches wide, and 24 inches in height. It is placed on a flat-bottom base that is supported by a metal platform and legs. In all, the entire system weighs 220 pounds. When sampling at one location is completed, the glovebag system is easily moved to the next sampling site. The system has the following features:

- Unobstructed view of glovebag interior
- Portable vacuum with HEPA filter to filter air and create negative pressure inside the glovebag
- Two glove access ports on each side of the glovebag for manual access
- Sealed access portal for transfer of prepared samples and equipment
- Color-coded quick-couple access ports located at the probe cover and the glovebag properly align sample transfer lines
- Collapsible frame for transport and storage.

The Glovebag Sampling System plays a significant role in capturing critical environmental data.

The glovebag's rectangular enclosure consists of a frame made of PVC pipe and nylon flex rods. The bag material is transparent nylon reinforced PVC sheathing polished on both sides. The seams are heat-sealed and some are sewn or glued. Four sets of yellow translucent PCV gloves provide direct worker access to the samples, and the sampling and analytical equipment as well. A sample and equipment transfer portal is located at one end of the glovebag and quick-couple probe connection lines

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are located at the opposite end. If the bag becomes highly contaminated, its various components can be collapsed and folded to simplify disposal.

System benefits

The Glovebag Sampling System offers important benefits in retrieving subsurface gas and water samples, including:

- Takes subsurface gas and water samples at remote locations
- Accommodates analysis of samples at the individual probe sites with appropriate levels of quality and radiological controls
- Prepares samples for transfer to analytical laboratories
- Protects sample integrity relying on glovebag capabilities and quality controls
- Protects workers and the environment from exposure to unknown contaminants
- Saves significant project dollars by using one portable system to retrieve samples from multiple probe sites.

Field technicians collect Lysimeter Probe water samples that are transferred into the protective glovebag.

Overall view of Glovebag Sampling System with its canopy, HEPA filter vacuum, and probe sampling ports.

Points of contact

To discuss how this sampling acquisition system might apply to your needs, contact *Andy Baumer*, or one of the other references at the phone or e-mail address shown. The INEEL's *Technology Catalog* is another reference on new and innovative technologies. It's on the web at *tech.inel.gov.*

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